ORIGINAL

Martin Blank PhD
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My perspective is that of a research scientist with over half century of experience as a professor of physiology and cellular biophysics at Columbia University as well as experience working for government and industry.

The problem assessing the risk of EMF exposure to smart meters:

- **the biological cause is the EMF and not the energy**
- **DNA is especially vulnerable, reacting with many frequencies (fractal antenna)**

A USDI (Interior) press release (March 2014) stated *"standards used by FCC (Federal Communications Commission) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today."* Existing EMF standards do not protect migrating birds and other plant and animal life.

To understand the risk associated with EMF one should ask scientists who study living cells - or better still – the cells themselves. Cells react to dangers in characteristic ways. Just like there are mechanisms to get organisms to breathe faster and pump blood faster when they sense danger, cells start to make stress proteins to correct damage caused by the different stresses they encounter (e.g., changes in pH, oxygen, temperature, and yes EMF!). Furthermore, they are more sensitive to EMF than to temperature - more sensitive to ELF than to RF! We have shown that the stress response is initiated by reaction with particular groups in DNA, and we have been able to stimulate synthesis of other proteins by attaching to these groups to DNA that codes for other proteins. These reactions can account for ongoing accumulation of DNA damage by exposure to the increasing ELF and RF in our environment. (You can read about this in my book - Overpowered, as well as in a recent Iceland study in Nature, August 22, 2012)

Biological research is almost totally missing in FCC evaluation, and this enables groups like ICNIRP to claim that there is no statistically significant proof of the effects of low intensity EMF. Epidemiology studies can only suggest correlations, but experimental cell biologists have found and explained many effects due to EMF exposure:

- Lai, Singh - DNA damage
- Goodman, Blank - cellular stress response, (cells react to many dangers and are far more sensitive to EMF than to heating)

- Barton group at Cal Tech – many papers on electron flow in DNA
- Blank, Soo – effects on electron transfer reactions in enzymes
- Goodman, Blank - DNA is a 'fractal antenna' - it reacts in ELF, RF/MW
- DNA coiled –coil structure in the nucleus as a result of fitting a 2m long DNA chain into a micron size nucleus, makes it vulnerable at kink points.

The WHO voted that ELF (2002) and RF/MW (2011) are possible carcinogens. **There are biology-based safety standards in *'BioInitiative Report'* (2012),** (online www.bioiniative.com) which suggest that the ELF standard should be 1000x lower and the RF standard 10,000x lower.

A recent study in Iceland mapped DNA mutations in 78 children and their parents. They found children's mutations correlate with their father's age and not with their mother's age. (Spermatocytes accumulate mutations while egg cells are protected in ovaries until released.) Mutations not found in either parent, indicate mutations in children early in development. Both findings suggest risk of mutation in our environment. (The data also show both autism and schizophrenia in children increase with father's age.) The above studies indicate increased risk to health due to growing EMF exposure in our environment.

Recent research by Carlberg and Hardell (*Int. J. Environ. Res. Public Health* **2014**, *11*, 10790-10805) claim that RF-EMF should be regarded as a human carcinogen requiring urgent revision of current exposure guidelines.
Dr. Joel Moskowitz has claimed that Dr. Maria Feychting, Vice-Chair of ICNIRP, has ignored recent increases in brain cancer rates within specific population subgroups or for certain types of tumors in at least five nations. The evidence compiled from the U.S., the U.K., Denmark, Norway, and Finland, is in a webinar for cancer prevention staff at the Centers for Disease Control and Prevention (CDC) (slides 26 - 31):
"Mobile Phone Use and Cancer Risk: Research on a Group 2B Carcinogen" Joel Moskowitz, Webinar for CDC Workgroup on Cancer Prevention (Oct 29, 2014)
Slides: http://bit.ly/CDCWebinar102914
Audio: http://bit.ly/101l2lR or http://bit.ly/1tDZbg2

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